

WESTERN SPELEOLOGICAL INSTITUTE INC.

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OBSERVATIONS

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ON NEW RADIOCARBON MEASUREMENTS

by

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INTRODUCTION:

Of necessity, there is a considerable time lag between the collecting of a radio-carbon sample, its run by the laboratory and its eventual publication by the laboratory or by the collector in a complete paper. To make such dates available without delay to interested students, we are taking this means of announcing dates secured by the WSI, and its member institutions, together with a preliminary statement of their apparent significance. It must be remembered however, that while every effort is made to fully determine the significance of a specimen and its date, later discoveries may invalidate our interpretations.

ACKNOWLEDGEMENTS:

Financial assistance in making field studies to collect this material has come from the Max C. Fleischmann Foundation of Nevada; Mr. O. H. Truman; Mrs. John D. Graham, and the National Geographic Society, during expeditions carried out for our member institutions, the Nevada State Museum and the Santa Barbara Museum of Natural History. The specimens were measured by Dr. Wallace S. Broecker of Lamont Geological Observatory, Columbia University, and Dr. Hans P. Suess of Scripps Institution of Oceanography, University of California. Further appreciation is due Dr. Broecker, Dr. Carl L. Hubbs, Mr. John Tyler, Mr. Buck Davis, Mr. Lee Orr, and Mr. John Orr for assistance in the field.

L: Lamont Geological Observatory number

LJ: Scripps Institution of Oceanography number

BP: Before present

- L. 446-B Shell (*Haliotis rufescens*) from 18-24" level in Highland Culture site (131.42 Pit M) representing the bottom of the occupational level. Six inches above this specimen, mixed shell was collected (L. 446-A) as yet undated, which represents the intermediate stratigraphy of this shallow site, and is directly associated with such "late" traits as circular fishhooks. The Highland Culture has not been properly characterized, but at present appears to be confined to the highlands of the islands, occupying the tops of slight knolls with the later sites still retaining evidence of small (8-10') house pits. Burials, so far are oriented with heads to the northwest, flexed and face down or on the left side. A total of 96 Highland sites are recognized 5370  $\pm$  150 yrs.

on the island, and they occur also on San Nicolas, San Clemente, San Miguel, Santa Cruz and Anacapa Islands.

The belief that these many sites located far from any existing water supply, and containing numerous grinding tools, are low in shell content, on Santa Rosa Island at least, represents a period of moist and cool climatic conditions, during the Medithermal, is supported by the radiocarbon date. While this date representing the oldest occupational level of the site does not definitely date such "late" artifacts as the circular shell fishhook, donut stone, and small triangular projectile points generally attributed to the Canalino Culture, it seems unlikely that the six inch separation between the dated level and these artifacts represents any major time span. Prior to securing this date, we had estimated the age of the site on geomorphological grounds at 4500 to 5000 years and on the basis of the archeological inventory at something less than 4000 years.

The radiocarbon date indicates we have been a bit too economical in judging the archeological content. Collected by Buck Davis and John Tyler, and submitted by Phil C. Orr, for the Santa Barbara Museum of Natural History.

L. 495-B

"Amberat" (refined) from Sheep Canyon Cave, Beaverhead County, Montana. Collected by Phil C. Orr, for The Western Speleological Institute.

5100  $\pm$  140 yrs.

"Amberat" is the term applied to a new hydrocarbon mineral which is found in dry western caves, and because of adhesive properties it collects many impurities, especially rat debris and excrement. This has resulted in its being generally attributed to urea, but it has also been attributed to smoke from Indian campfires, seepage from surface vegetation and as a distillate of organic material collected in the cave. It has never been properly described because its exact nature is as yet, not known. The only two published references known to this writer are, Orr 1957 OBSERVATIONS, (Western Speleological Institute) No. 2 and Broecker and Kulp, 1957 SCIENCE, Vol. 127, No. 3287 p 9 L. 364-BI, where material from Fishbone Cave, Nevada, was dated at 4150  $\pm$  150 yrs.

This writer has held to the opinion it is due to fossil organic materials contained in the limestone. As Broecker and Kulp said, the radiocarbon date of 4150 years did not support this on the Fishbone Cave sample, but later examination of this sample showed it to be highly impure, and composed of insect parts, dust, rat debris and vegetable parts. The date of 4150 was consistent with such impure material. An attempt was made to refine the Montana specimen by solution in distilled water and filtering which eliminated non-soluble impurities, but left such solubles as urea.

As this material was secured from paleozoic limestones which should be "dead" to radiocarbon, the date of 5100 yrs. would indicate an unbelievable high contamination if this theory of fossil origin is correct.

Further work is being carried out, and correspondence from interested geochemists and geologists is invited.

LJ. 27

Shell (*Haliotis rufescens*) exposed in sea cliff east of Arlington Canyon, Santa Rosa Island, at a depth of 15 feet under water laid clays, and representing an Indian midden Loc. 131.6. This material was collected by Dr. Carl L. Hubbs, Scripps Institution of Oceanography, and represents midden shell in terrestrial deposits about seven feet lower, and 10 to 15 feet east of the specimen collected and dated by Dr. Broecker at  $6820 \pm 160$  yrs. (L. 257) Broecker, Kulp, and Tucek, 1956, SCIENCE, Vol. 124, No. 3213.

$7440 \pm 200$  yrs.

The 400 year difference in these specimens for the seven feet of water laid deposits between them is reasonable, considering the conditions of geologically rapid deposition from the nearby hillside and represents a time near the beginning of deposition of archeological site 131.6, which has been built to a depth of more than 20 feet of inter-bedded midden water laid clays and wind blown sand. It is of further interest in that it represents the time of some of the last water laid deposition on the flood plain, which was later eroded into 100 foot sea cliffs, and was followed by a retreat of the shore line for several hundred yards, and subsequent dune building.